HP ProLiant ML150 Generation9 (Gen9)

The HP ProLiant ML150 Gen9 Server delivers the essential mix of performance, price and expandability to fit the needs of growing budget conscious businesses. Designed as a dual-socket tower server, it is a right size tower with performance and expandability. With expansion options, it allows you to grow as needed with a low initial capital outlay. Covering a wide range of applications and workloads and addressing our customers from sophisticated SMB to large enterprise class server environments.
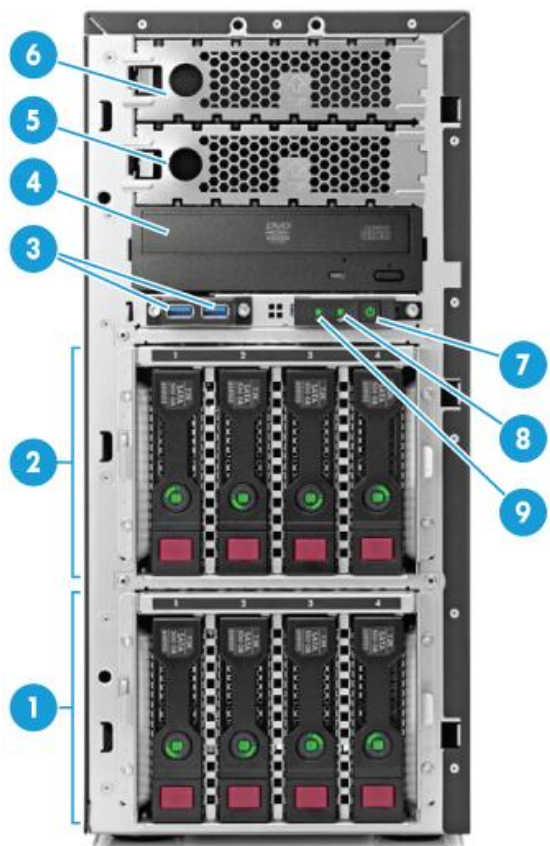

Front view details for Rack (SFF) and Tower (LFF)

1. Drive Cage (4 LFF shown) Alternative server choice
   would offer 8 SFF
2. Drive Cage (4 LFF shown) Alternative server choice
   would offer 8 SFF
3. USB 3.0 (2)
4. Media bay, Optional SATA 9.5mm DVD-ROM shown.
5. Media bay, blank shown.*
   NOTE: *Optional choices: SATA 9.5mm DVD-ROM or DVD
   RW Optical Drive, Tape Drive, or LFF.
   NOTE: When populating 10 LFF, not able to install Tape
   Drive or Optical Drive. Possible Configurations: 1) 8LFF
   +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or
   3) 9LFF + 1 Tape Drive (Full/Half).
6. Media bay, blank shown.*
   NOTE: *Optional choices: SATA 9.5mm DVD-ROM or DVD
   RW Optical Drive, Tape Drive, or LFF.
   NOTE: When populating 10 LFF, not able to install Tape
   Drive or Optical Drive. Possible Configurations: 1) 8LFF

Overview

+1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or
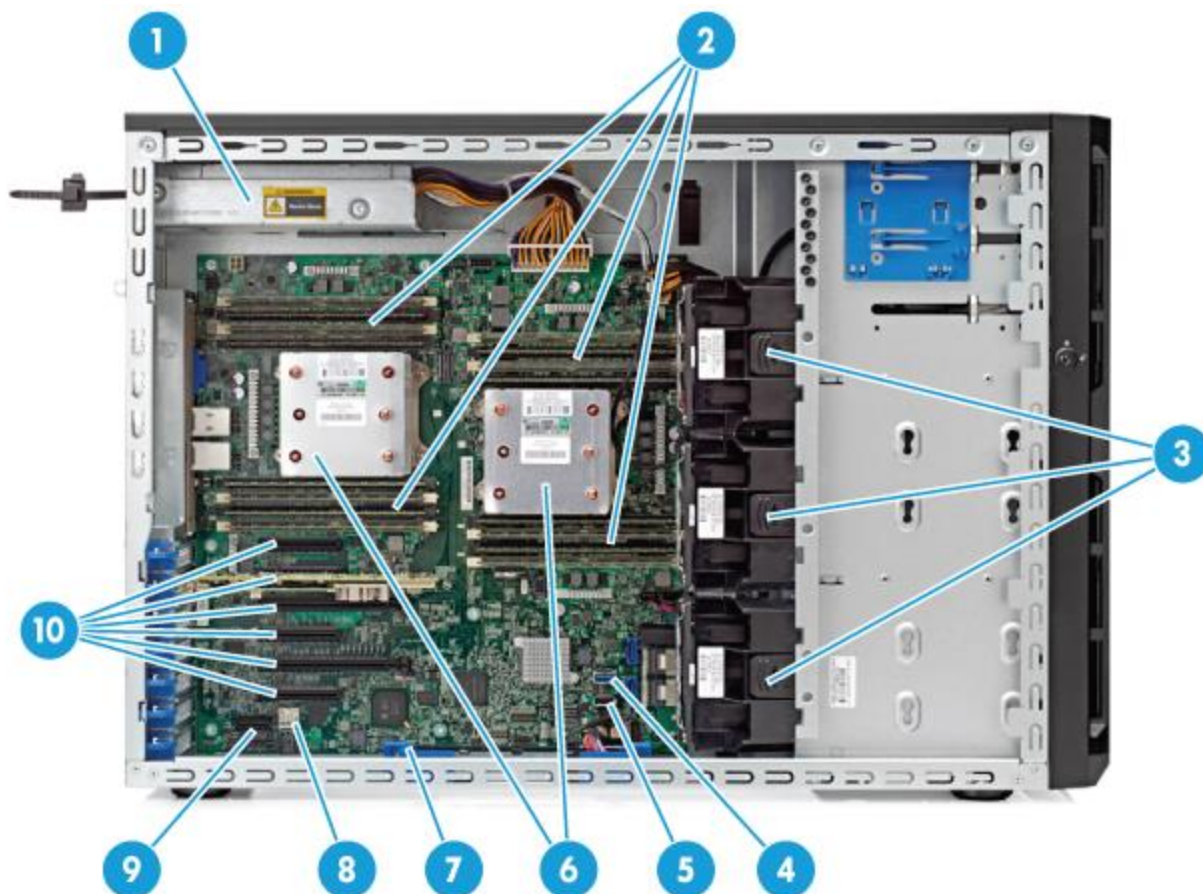3) 9LFF + 1 Tape Drive (Full/Half).
7. Power On/Standby button and system power LED
button
8. NIC status
9. Health LED
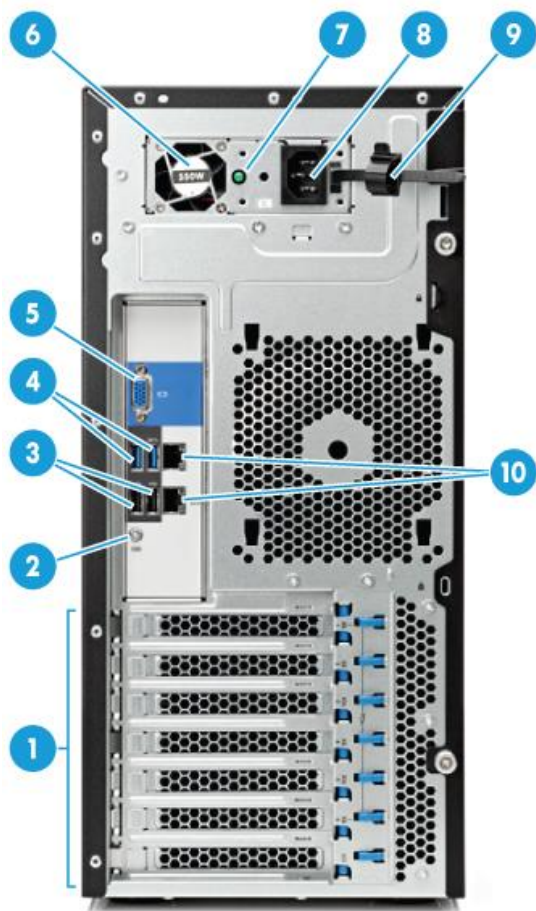
Rear View (Tower Model)

1. PCI Slots (Slots 1-6) Slot 1 and 3 can support Optional
GPU
2. Unit ID LED
3. USB 2.0 (2)
4. USB 3.0 (2)
5. Video Connector
6. HP 550W Power Supply
7. Power supply Power LED
8. Power Supply Power connection
9. Cable tie back
10. Network RJ-45 Ports (2)

Overview

Interior View (Rack Model)

1. Power Supply
2. Sixteen (16) DDR4 DIMM slots. Shown fully populated in 16 slots (8 per processor)
3. System Fans: Three fans for 2P SKU
4. Internal USB 3.0 connector
5. Internal USB 2.0 connector
6. Two (2) processors and heatsinks with HP Smart Socket Guide (Second Processor is Optional)
7. Gen9 Smart Storage Battery Holder Kit
8. MicroSD slot
9. Dedicated iLO module slot
10. Six (6) PCIe expansion slots

Standard Features

NOTE: For more information regarding Intel Xeon processors, please see the following http://www.intel.com/xeon.

Intel® Xeon® processor E5-2600 v3 product family is designed to deliver the best combination of performance, built-in capabilities, and cost-effectiveness. One (or two) of the following Intel® Xeon® E5-2600 v3 processors based on the model.

Processor
One of the following depending on model

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
E5-2650Lv3	1.8GHz	12	30MB	65W	9.6GT/s	2133
E5-2640v3	2.6GHz	8	20MB	90W	8.0GT/s	1866
E5-2630v3	2.4Ghz	8	20MB	85W	8.0GT/s	1866
E5-2620v3	2.4GHz	6	15MB	85W	8.0GT/s	1866
E5-2609v3	1.9GHz	6	15MB	85W	6.4GT/s	1600
E5-2603v3	1.6GHz	6	15MB	85W	6.4GT/s	1600

NOTE: Up to 2 processors supported. Mixing different processor models is not supported.
NOTE: Recommend to select 900W for 2P configuration or check power advisor for power consumption for the customer usage case.

Cache Memory
One of the following depending on model

15MB (1 x 15MB) Level 3
NOTE: For Six-core processors.
20MB (1 x 20MB) Level 3
NOTE: For Eight-core processors.
30MB (1 x 30MB) Level 3
NOTE: For Twelve-core processors.

Chipset

Intel® C610 Series Chipset
Intel® E5-2600v3 Processor Family
NOTE: For more information regarding Intel® chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/.

On System Management Chipset

HP iLO (Firmware HP iLO4 2.0) 2GB NAND
NOTE: 1GB USB user space configurable via UEFI and accessible via iLO. Read and learn more in the iLO QuickSpecs.

Memory

Type:
HP SmartMemory
DDR4 Registered (RDIMM) or Load Reduced (LRDIMM)
DIMM Slots Available   16
Maximum Capacity (LRDIMM)   256GB   (16 x 16GB LRDIMM @2133MHz)
Maximum Capacity (RDIMM)   256GB   (16 x 16GB RDIMM @2133MHz)
NOTE: This server does not support mixing LRDIMMs or RDIMMs. Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS installation.

Memory Protection

Advanced ECC   Advanced ECC uses single device data correction to detect and correct single and all multi-bit error that occurs within a single DRAM chip.

Online spare   Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.

Expansion Slots

Expansion Slots #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
6	PCIe 3.0	x8	x8		Half Length/Full Height	For processor 1
5	PCIe 3.0	x16	x16		Full Length/Full Height	For processor 1
4	PCIe 3.0	x8	x8		Half Length/Full Height	For processor 1
3	PCIe 3.0	x16	x16		Full Length/Full Height	For processor 2
2	PCIe 3.0	x8	x8		Half Length/Full Height	For processor 1
1	PCIe 3.0	x8	x8		Half Length/Full Height	For processor 2

Standard Features

NOTE: Bus number - Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.
NOTE: Six total expansion PCIe 3.0 slots. Two PCIe 3.0 x16 (x16 speed); Four PCIe 3.0 x 8 (x8 speed).

Expansion Slots #	Technology	Bus Width	Connector Width	Bus Number	Device Number	Form Factor	Notes
7	HP ML Gen9 Dedicated iLO Port Kit	x1	x1			Dedicate for ML Series	

Storage Controller
One of the following depending on model

Entry Models	HP Dynamic Smart Array B140i Controller

NOTE: B140i can't mix with any standup internal controller.

Base Models	HP Dynamic Smart Array B140i Controller

NOTE: B140i can't mix with any standup internal controller.

Performance Models	HP H240 FIO Smart Host Bus Adapter

Internal Storage Devices
One of the following depending on model

Optical Drive
Optional SATA 9.5mm DVD-ROM Optical Drive
Optional SATA 9.5mm DVD RW Optical Drive
NOTE: Optical is optional in entry, base and performance models.
NOTE: ML150 Gen9 Slim ODD Enablement Kit (PN: 784603-B21) is required for any DVD options.

Hard Drives
None ship standard

Hard Drive Bays
Up to 10 Non-hot plug SATA 3.5" drives
NOTE: Mixing drive cage types is not allowed.
NOTE: All Pre-configured Models come populated with hard drive blanks installed. The 4LFF configurations includes 2 blanks and 8SFF includes 6 blanks. Additional hard drive blanks can be ordered using either P/N 666986-B21 for the HP LFF HDD Blank Kit or P/N 666987-B21 for the HP SFF HDD Blank Kit. These part numbers for single HDD blanks below are also provided should you require replacement HDD blanks for your server.
NOTE: NHP SATA is limited to B140i controller.
NOTE: When populate 10 LFF, not able to install any Tape Drive and Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).
NOTE: Must select two 4LFF NHP drive cage and 10LFF enablement kit if customer wants to support 10 LFF drives.
(4) Hot plug LFF SAS/SATA HDD bays; upgradable to (8)
(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (16)
NOTE: 16SFF is limited to P840 controller.
NOTE: H240 8LFF/8SFF require 2 cable kit P/N: 784606-B21.
NOTE: P840 16SFF require 2 cable kit P/N: 784608-B21.

Maximum Internal Storage
One of the following depending on model

	CAPACITY	CONFIGURATION
Hot Plug LFF SAS	60TB	10 x 6TB
Hot Plug LFF SATA	60TB	10 x 6TB
Hot Plug SFF SAS	19.2TB	16 x 1.2TB
Hot Plug SFF SATA	16TB	16 x1TB
Non-Hot Plug LFF SATA	30TB	10 x 3TB
Hot Plug LFF SAS SSD	16TB	10 x 1.6TB
Hot Plug LFF SATA SSD	16TB	10 x 1.6TB
Hot Plug SFF SAS SSD	25.6TB	16 x 1.6TB
Hot Plug SFF SATA SSD	25.6TB	16 x 1.6TB

Power Supply
One of the following depending on model

HP 550W FIO Power Supply
HP 800W/900W Gold AC Power Input Module

Standard Features

HP Entry-Level Power Supplies provide lower-cost options for customers trying to balance their need for enterprise class efficiency and reliability while maintaining lowest possible hardware costs. All Entry-Level power supply options have been designed specifically for HP ProLiant Gen9 Essential Series servers.

The HP 550W FIO Power Supply is the standard, non-redundant AC power supply option for most HP ProLiant Gen9 Essential servers. It features Silver-level (89%) certified power efficiency with a set of features optimized for the Gen9 Essential-series rack and tower servers.

The HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module with Power Backplane can be configured to support power redundancy in ProLiant servers that offer only a single power supply bay, providing additional protection against power loss. With an 80 Plus Gold power efficiency rating (up to 92%), this power option helps to reduce operating expenses while protecting against trapped power capacity in the data center. Each power backplane option can support up to two (2) hot-plug AC power input modules.

All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (A0K02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the ProLiant Power Cables web page.

To review the power requirements for your selected system, please use the HP Power Advisor Tool located at http://www.hp.com/go/hppoweradvisor.

Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

Rack Options
One of the following depending on model

HP T/R CONV TRAY UNIVERSAL Kit

System Fans
One of the following depending on model

	Non-redundant	Redundant
1P model	2 fans	NA

NOTE: Two (2) Non-hot plug, non-redundant fans ship as standard.

	Non-redundant	Redundant
2P model	3 fans	NA

NOTE: Third fan is shipped with 2nd CPU Kit. Third fan is only required in 2P configurations.

Interfaces

Video	1 (rear)
Network RJ-45 (Ethernet)	2
HP iLO Remote Management Network Port	2 Gb Dedicated
Micro SD Slot	1 (internal)

NOTE: The Micro-SD slot is not a hot-pluggable device. Customers should not attempt to plug a Micro-SD card into the Micro-SD slot while the server is powered.

USB 3.0	5 (2 rear, 1 internal, 2 front)
USB 2.0	3 (2 rear, 1 internal)

Operating Systems and Virtualization Software Support for ProLiant Servers

Microsoft Windows Server
Canonical Ubuntu
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
VMware
Oracle Solaris

NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page http://www.hp.com/support/ML150Gen9.

Upgradeability

Upgradeable to two processors (24 cores)
NOTE: Total 6, 8, 12cores.
Up to 16 SFF Hard Drive Bays; Or 10 LFF Hard Drive Bays

Standard Features

Up to 16 DIMM slots
Redundant Power Supply
Tower to rack conversion
Optional optical drive (up to 1)
NOTE: When populate 10 LFF, not able to install Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

Industry Standard Compliance	ACPI 2.0b Compliant PCIe 3.0 Compliant PXE Support WOL Support Novell Certified IPMI 2.0, SMASH CLP, DCMI 1.0 compliant Microsoft® Logo certifications USB 3.0 Support SMBIOS 2.7.1 ASHRAE A3
Graphics	HP NVIDIA Quadro K2200 GPU Module

HP Server UEFI/Legacy ROM

HP Server UEFI /Legacy ROM
Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better manageability and more secured configuration while interacting with your server at boot time. HP ProLiant Gen9 platform defaults to UEFI and can be factory or field configured for Legacy BIOS Boot Mode.
NOTE: The UEFI System Utilities function is analogous to the HP ROM-Based Setup Utility (RBSU) of legacy BIOS. For more information, please visit http://www.hp.com/go/proliantuefi/docs.
UEFI enables numerous new capabilities specific to HP ProLiant servers such as:

- Secure Boot

- Operating system specific functionality

- Support for > 2.2 TB (using GPT) boot drives

- USB 3.0 Stack

- Embedded UEFI Shell

- Mass Configuration Deployment Tool using HP RESTful API.

- PXE boot support for IPv6 networks

- Boot support for option cards that only support a UEFI option ROM

For more information please visit http://www.hp.com/go/proliant/uefi.
NOTE: For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.
NOTE: HP UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory.

Form Factor	Tower or Rack (5U)

Embedded Management	**HP Integrated Lights-Out (HP iLO)**	Monitor your servers for ongoing management, service alerting, reporting and remote management with HP iLO. Learn more at http://www.hp.com/go/ilo.
	UEFI	Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at http://www.hp.com/go/ProLiant/uefi.
	HP RESTful API	RESTful API is an application programming interface. RESTful Web Service API served by iLO's web server: Learn more at http://www.hp.com/go/restfulapi.

Standard Features

	Intelligent Provisioning	Provision servers by discovering and deploying 1 to few servers with Intelligent Provisioning. Learn more at http://www.hp.com/go/intelligentprovisioning.
	Embedded Remote Support	HP's embedded remote support, when used with Insight Online direct connect or HP Insight Remote Support, allows HP ProLiant servers to transmit hardware events directly to HP or an HP Authorized Partner for automated phone home support. Learn more at http://www.hp.com/go/insightonline/info.
Server utilities	**HP Smart Update**	Optimize firmware and driver updates with HP Smart Update solutions. Learn more at http://www.hp.com/go/smartupdate.
	HP Systems Insight Manager (HP SIM)	HP SIM allows you to monitor the health of your HP ProLiant Servers and HP Integrity Servers, and also provides you with basic support for non-HP servers. HP SIM also integrates with HP SUM to provide quick and seamless firmware updates. Learn more at http://www.hp.com/go/sim.
	Scripting Tool Kit and Windows PowerShell	Provision 1 to many servers using your own scripts to discover and deploy them with HP Scripting Tool Kit for Windows and Linux or HP Scripting Tools for Windows PowerShell. Learn more at http://www.hp.com/go/ProLiantSTK or http://www.hp.com/go/powershell.
	HP RESTful Interface Tool	HP RESTful Interface tool is a scripting tool to provision servers using RESTful API Interface to discover and deploy servers at scale. Learn more at http://www.hp.com/go/restfulapi.
	HP iLO Mobile Application	Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: http://www.hp.com/go/ilo/mobileapp.
	HP Insight Online	HP Insight Online, available at no additional cost as part of your HP warranty, Care Pack or contractual support agreement with HP, is a personalized dashboard for simplified tracking of IT operations and support information from anywhere, anytime. Learn more at http://www.hp.com/go/insightonline/info.

NOTE: The Service Pack for ProLiant (which includes HP SUM) can be downloaded from http://www.hp.com/go/spp/download. More information can be found: http://www.hp.com/go/SmartUpdate, http://www.hp.com/go/spp and http://www.hp.com/go/hpsum.

Security	Power-on password Setup password Serial interface control Power switch security Administrator's password TPM 1.2 UEFI
Warranty	This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. **NOTE:** Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Optional Features

Embedded Management	**iLO Essentials**	HP iLO Essentials is the preferred license for small and medium business that offers full remote server management capabilities for small and medium business via the Integrated Remote Console (IRC), virtual media, and e-mail based alerts. Learn more about HP iLO Essentials at http://www.hp.com/go/iLO/essentials.
	iLO Scale-Out	HP iLO Scale-Out is the preferred license built for web hosting, cloud service providers, and high performance computing data centers, managing massive scale out environments. This license offers sophisticated scripting tools that provides remote access through Text Console via SSH, Dynamic power capping, Email-based Alerting and proactive notifications. For more information, visit http://www.hp.com/go/iLO/scale-out.
	iLO Advanced	HP iLO Advanced licenses offer smart remote functionality without compromise, for all HP ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality. Learn more about HP iLO Advanced at http://www.hp.com/go/iloadvanced.

Server Management	**HP Insight Control**	HP Insight Control, lets you deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol.

High Performance Clusters

HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu.

HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters.

HPC Interconnects

NOTE: High Performance Computing (HPC) interconnect technologies are available for this server under the HP Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand Interconnects: http://www.hp.com/techservers/clusters/ucp/index.html.

Storage Software

Whether you need to solve a specific data protection, archiving, or storage command and control challenge, or deliver on strategic consolidation, compliance, or continuity initiatives, look no further than HP storage software. Our storage software helps you reduce costs, simplify storage infrastructure, protect vital assets and respond faster to business opportunities.
Storage software that gets the job done:

- **Data Protection and Recovery Software**
  Whether you're a large enterprise or a smaller business, HP data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.
- **Data Archive and Migration Software**
  HP's storage software enables you to comply with data retention and retrieval requirements, improve application performance, and reduce costs by efficiently migrating infrequently accessed or less valuable data to lower cost storage.
- **Storage Resource Management Software (SRM)**
  HP's storage resource management software reduces operational costs and provides the command and control foundation you need to efficiently manage and visualize your physical and virtual environments.
- **Data Replication Software**
  HP offers array-based and host-based replication software for use in disaster recovery, testing, application development and reporting.

Optional Features

- **Storage Device Management Software**
  Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.

- **HP StoreVirtual VSA**
  With HP StoreVirtual VSA you can use the power of virtualization to create a virtual array within your host server. Manage it as a single pool of shared storage capacity, and scale it to match your evolving needs. HP ProLiant Gen9 servers include a 3-year limited license for HP StoreVirtual VSA software with 1TB of capacity at no extra cost. Simply select to install HP StoreVirtual VSA software during server setup within Intelligent Provisioning. More information, instructional videos, and free console management software are available at http://www.hp.com/go/vsa1TB.

  NOTE: For more information about Storage Software including QuickSpecs, please see: http://www.hp.com/go/storage/software.

One Config Simple (SCE)	SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator.

Service and Support

Service and Support	**HP Technology Services for Industry Standard Servers** HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time. **Protect your business beyond warranty with HP Care Pack Services** HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.
Optimized Care	**Supports maintaining servers at optimum performance availability** **HP Proactive Care with 24x7 coverage, three year Care Pack Service** HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP. This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf
Standard Care Package	**Supports maintaining high level of server availability** **Foundation Care 24x7, three-year Care Pack Service** HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed; collaborative software included in this Care Pack service provides troubleshooting assistance on industry leading software running on your HP server. Simplify your support experience and make HP your first call for hardware or software questions. http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en
Related Services	**HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf **Factory Express for Servers and storage** HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express. **Data Privacy Services** Protect your data through better media management. HP Data privacy services help manage and protect sensitive data to reduce the risk of unauthorized access to private information and help meet compliance requirements. Our retention services allow you to keep drives and other devices upon failure, our removal services provide convenient data sanitization and our recovery services allow you to safely retire IT assets and capture any remaining value from the hardware. http://www.hp.com/services/dataprivacy Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc
Get connected to HP to improve your support experience	Prevent problems with innovative, automated monitoring tools and proactive services. Combining Proactive Care Services with our remote support technology such as Insight Online provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: http://www.hp.com/go/proactiveinsightexperience
HP Support Center	Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc HP's Support Center Mobile App** allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

Service and Support

HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

** HP Support Center Mobile App is subject to local availability.

Parts and Materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction.

For more information

To learn more on HP ProLiant servers, please contact your HP sales representative or HP Authorized Channel Partner or visit: http://www.hp.com/services/proliant

Pre-configured Models

For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.
1. Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
2. HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
3. If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

NOTE: All Pre-configured Models come populated with some hard drive blanks installed. Should the customer need additional hard drive blanks, they can order more using either P/N 666987-B21: HP SFF Hard Drive Blank Kit or P/N 666986-B21: HP LFF Hard Drive Blank Kit.
NOTE: All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (A0K02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the ProLiant Power Cables web page.

Caution: HP recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation.

	Entry Models	**Base Models**
[SKU Number]	776274-001	776275-001
Model Name	HP ProLiant ML150 Gen9 E5-2603v3 4GB B140i Non-hot Plug 4LFF SATA Entry 550W PS Server	HP ProLiant ML150 Gen9 E5-2609v3 8GB B140i Hot Plug 4LFF SATA Base 550W PS Server
Processor	Intel® Xeon® E5-2603v3	Intel® Xeon® E5-2609v3
Number of Processors	One	
Memory	4GB (1x4GB Registered DIMMs, 2133 MHz)	8GB (1x8GB Registered DIMMs, 2133 MHz)
Network Controller	Broadcom 5717 Dual-port 1GbE	
Storage Controller	HP Dynamic Smart Array B140i	
Hard Drive	None ship standard	
Internal Storage	4 LFF HDD Bays (Non Hot Plug)	4 LFF HDD Bays
Optical Drive Bay	1; (Optional: DVD-ROM, DVD-RW)	
Optical Drive	Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive)	
PCI-Express Slots	6 PCIe slots	
Power Supply	(1) HP 550W FIO Power Supply	
Fans	2 non-hot plug, non-redundant fans	
Management	Mid-tier iLO with 2GB NAND	
Form Factor	Tower (5U)	
Warranty	Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.	

	Performance Models
[SKU Number]	776276-001
Model Name	HP ProLiant ML150 Gen9 E5-2620v3 16GB H240 Hot Plug 8SFF SAS Perf 900W PS Server
Processor	Intel® Xeon® E5-2620v3
Number of Processors	One
Memory	16GB (1x16GB Registered DIMMs, 2133 MHz)
Network Controller	Broadcom 5717 Dual-port 1GbE
Storage Controller	HP H240 Smart Host Bus Adapter **NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is included while order Performance Model with H240 Storage Controller
Hard Drive	None ship standard
Internal Storage	8 SFF HDD Bays
Optical Drive Bay	1; (Optional: DVD-ROM, DVD-RW)
Optical Drive	Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive)
PCI-Express Slots	6 PCIe slots
Power Supply	(1) HP 900W FIO Power Supply
Fans	2 non-hot plug, non-redundant fans
Management	Mid-tier iLO with 2GB NAND
Form Factor	Tower (5U)

Pre-configured Models

Warranty	Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.

Configuration Information - Factory Integrated Models

This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

1. Factory Integrated Models must start with a CTO Server.
2. FIO indicates that this option is only available as a factory installable option.
3. All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.
4. Some options may not be integrated at the factory. Contact your local sales representative for additional information.

Step 1: Base Configuration (choose one of the following configurable models)

[Chassis]	HP ProLiant ML150 Gen9 Non-hot Plug 4LFF Configure-to-order Server	HP ProLiant ML150 Gen9 Hot Plug 4LFF Configure-to-order Server	HP ProLiant ML150 Gen9 Hot Plug 8SFF Configure-to-order Server
SKU Number	767062-B21	767063-B21	767064-B21
Processor	2 (optional) x HP Smart Socket Guides		
DIMM Slots	16 DIMM slots for RDIMM, LRDIMM DDR4 Memory		
Storage Controller	HP Dynamic Smart Array B140i		
PCIe	6 Standard (4FH/HL, 2FH/FL)		
Drive Cage	4LFF Non Hot Plug	4LFF Hot Plug	8LFF Hot Plug
Network Controller	Broadcom 5717 Dual-port 1GbE		
Fans	2 non-hot plug, non-redundant fans		
Management	Mid-tier iLO with 2GB NAND		
USB	2 front, 2 internal, 4 rear		

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

HP Processors	**Entry Processors - E5-2600v3 series Processors**	
	HP ML150 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	726663-L21
	HP ML150 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit	726660-L21
	Base Processors - E5-2600v3 series Processors	
	HP ML150 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	726657-L21
	HP ML150 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit	726653-L21
	HP ML150 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	726650-L21
	Performance Processors - E5-2600v3 series Processors	
	HP ML150 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit	726667-L21

NOTE: If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

NOTE: Up to two processors are supported. Mixing different processor models is not supported.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version number.

HP Memory	**Registered DIMMs (RDIMMs) for E5-2600v3 Series**	
	HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
	HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
	HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
	Load Reduced DIMMs (LRDIMMs) for E5-2600v3 Series	
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21

Configuration Information - Factory Integrated Models

NOTE: LRDIMM, RDIMM are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen9 servers support LRDIMM and RDIMM.

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9.

NOTE: If only one processor is installed, only half of the total DIMM slots are available. When populating with two processors all DIMM slots are available.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://www.hp.com/go/proliant-energy-efficient.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133MHz, 1866MHz, 1600MHz, or 1333MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: http://www.hp.com/go/ddr4config.

HP Power Supplies	**HP Entry-Level Power Supplies**	
	HP 550W FIO Power Supply Kit	730941-B21

NOTE: The above power supply option is 80Plus Silver-certified with an efficiency rating of up to 89%. Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module	744689-B21

NOTE: The above power supply option is 80Plus Gold-certified with an efficiency rating of up to 92%. Each power backplane kit (745813-B21) can support up to two (2) AC power input modules (744689-B21). Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

NOTE: HP 800W/900W Gold AC Power Input Module only support up to maximum 800W redundant with 2 x 900W power module.

NOTE: Must select power backplane along with 900W power module:
900w power module x 1 requires 900W power backplane x 1 (Non-redundant PSU)
900w power module x 2 requires 900W power backplane x 1 (Redundant PSU)

NOTE: Recommend to select 900W for 2P configurations or check power advisor for power consumption for the customer usage case. Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

HP Server Redundant Power Supply Backplane Kit	745813-B21

NOTE: Each power backplane kit (745813-B21) can support up to two (2) AC power input modules (744689-B21). HP Server Redundant Power Supply Backplane Kit is required if selecting P/N: 744689-B21.

HP Storage Controllers	**NOTE:** If not using the embedded B140i controller as primary controller, must select one of the following HP Storage Controllers noted below to support SAS drives depending on CTO Server model selected in Step 1.

HP Smart Array Controllers

HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller	761872-B21

NOTE: If HP ProLiant ML150 Gen9 4LFF CTO Server (PN: 767063-B21) or HP ProLiant ML150 Gen9 8SFF CTO Server (PN: 767064-B21) is selected in Step 1.

NOTE: Must also select Smart Storage Battery Holder Kit (PN: 786710-B21).

NOTE: Must also select one HP ML150 Gen9Mini SAS P440/P840 Cable Kit (PN: 784606-B21).

NOTE: Must also select one HP ML150 Gen9 PCI BAFFLE Kit (779861-B21).

HP Smart Array P840/4GB FBWC 12Gb 2-ports Int FIO SAS Controller	761874-B21

NOTE: If HP ProLiant ML150 Gen9 8SFF CTO Server (PN: 767064-B21) is selected in Step 1.

NOTE: This controller is required if HP ML150 Gen9 8SFF Hot Plug Drive Cage (PN: 725874-B21) is selected.

NOTE: Must also select Smart Storage Battery Holder Kit (PN: 786710-B21).

NOTE: Must also select two HP ML150 Gen9Mini SAS P440/P840 Cable Kits (PN: 784606-B21).

NOTE: Must also select one HP ML150 Gen9 PCI BAFFLE Kit (779861-B21).

HP Smart Host Bus Adapters

HP H240 12Gb 2-ports Int FIO Smart Host Bus Adapter	761873-B21

NOTE: If HP ProLiant ML150 Gen9 4LFF CTO Server (PN: 767063-B21) or HP ProLiant ML150 Gen9 8SFF CTO Server (PN: 767064-B21) is selected in Step 1.

NOTE: Must also select one HP ML150 Gen9 Mini SAS H240 Cable Kit (PN: 784606-B21) to support the HP ProLiant ML150 Gen9 4LFF CTO Server or two Cable Kits (PN: 784606-B21) to support HP ProLiant ML150 Gen9 8SFF CTO Server or if adding HP ML150 Gen9 4LFF Hot Plug Drive Cage (PN: 725872-B21).

HP Cable Options

Configuration Information - Factory Integrated Models

HP ML150 Gen9 Mini SAS H240 Cable Kit	784606-B21
HP ML150 Gen9 Mini SAS P440/P840 Cable Kit	784608-B21
Battery Holder	
HP ML150 Gen9 Smart Storage Battery Holder Kit	786710-B21

Step 3: Choose Additional Factory Integratable Options

BIOS Mode HP Legacy FIO Mode Setting 758959-B21

NOTE: If B140i is the only primary controller, then this option cannot be selected.
NOTE: Selecting this option will change the default UEFI BIOS setting into Legacy BIOS setting.

Controller State HP Mfg FIO Enable HBA Mode Setting 792962-B21

NOTE: Can only be selected with H240 FIO Smart Host Bus Adapter
NOTE: If H240 is the primary controller then RAID is not allowed with this selection.

HP AHCI-Enable FIO Setting 801845-B21

NOTE: If B140i is the primary controller then RAID is not allowed with this selection.

Step 4: Choose Additional Options for Factory Integration from Core and Additional Options sections below.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Unique Options

HP ML150 Gen9 4LFF Hot Plug Drive Cage   725872-B21
NOTE: Adding 4LFF Hard Drive Cage allow up to 8FF Drive Bays.

HP ML150 Gen9 8SFF Hot Plug Drive Cage   725874-B21
NOTE: Adding 8SFF Hard Drive backplane allow up to 16SFF Drive Bays.

HP ML150 Gen9 4LFF Non-hot Plug Drive Cage   779859-B21
NOTE: Adding 4LFF Hard Drive Cage allow for up to 8LFF Drive Bays.

HP ML150 Gen9 PCI Baffle Kit   779861-B21
NOTE: Must select when a PCIe card is installed with any Networking, Controllers (SAS, SCSI and Fiber Channel), Graphic options.

HP ML150 Gen9 Slim ODD Enablement Kit   784603-B21
NOTE: Must select with the ODD option.

HP ML150 Gen9 Smart Storage Battery Holder Kit   786710-B21
NOTE: Must select when install Smart Store Battery PN: 727258-B21.
NOTE: Must select when install P440/840 FIO controller PN: 761872-B21/761874-B21.
NOTE: Must select when support upgrade battery.

HP ML150 Gen9 9/10LFF Drive Enablement Kit   788567-B21
NOTE: When populate 10 LFF, not able to install any Tape Drive or Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).
NOTE: Must select both 4LFF NHP drive cage and 10LFF enablement kit if plan to expand to 10LFF.
NOTE: Only support NHP SATA HDD.
NOTE: Must select P840/4G controller.

HP ML150 Gen9 Dedicated iLO Management Port Kit   780310-B21

HP ML150 Gen9 Mini SAS H240 Cable Kit   784606-B21
NOTE: Must be selected for H240 controller.
1 cable kit is required for Hot Plug 4LFF.
2 cable kits are required for below:
- Hot Plug 4+4 LFF (with additional drive cage)
- 8SFF

HP ML150 Gen9 Mini SAS P440/P840 Cable Kit   784608-B21
NOTE: Must be selected for P440/P840 controller.
1 cable kit is required for P440x1.
2 cable kits are required for P840x1.

HP Tower to Rack Conversion Tray Universal Kit   417705-B21

HP Processors

Entry Processors - E5-2600v3 series Processors

HP ML150 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit   726663-B21

HP ML150 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit   726660-B21

Base Processors - E5-2600v3 series Processors

HP ML150 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit   726657-B21

HP ML150 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit   726653-B21

HP ML150 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit   726650-B21

Performance Processors - E5-2600v3 series Processors

HP ML150 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit   726667-B21

NOTE: Recommend to select 900W for 2P configurations or check power advisor for power consumption for the customer usage case.

HP Memory

Registered DIMMs (RDIMMs) for E5-2600v3 Series

HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit   803026-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit   803028-B21
HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit   726717-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit   726718-B21

Core Options

	HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
	Load Reduced DIMMs (LRDIMMs) for E5-2600v3 Series	
	HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
HP Optical Drives	HP 9.5mm SATA DVD-ROM JackBlack Gen9 Optical Drive	726536-B21
	HP 9.5mm SATA DVD-RW JackBlack G9 Optical Drive	726537-B21
	HP ML150 Gen9 Slim ODD Enablement Kit	784603-B21
	NOTE: Must be selected with the ODD option. **NOTE:** Must select ODD enablement kit, one kit per ODD.	
HP Drives	**NOTE:** User may select any combination of SAS or SATA Hard Drives. However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set. **NOTE:** If B140i is the primary controller, user can only select SATA drives. **NOTE:** User may select any combination of SAS or SATA Hard Drives. However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set. **NOTE:** SAS drives require the selection of a SAS controller. See card lists in Controllers section.	
	SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
	HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
	HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
	HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759212-B21
	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
	HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759210-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
	HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759208-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21
	SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
	HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21
	HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
	SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
	HP 450GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	737394-B21
	HP 300GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	737261-B21
	HP 600GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	765424-B21
	SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 6TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	761477-B21
	HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	695510-B21
	HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652766-B21
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652757-B21
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652753-B21
	SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
	HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
	HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
	SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	753874-B21
	HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	693687-B21
	HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	628061-B21
	HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658079-B21
	HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	657750-B21

Core Options

HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21
SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	628065-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21
12G SAS Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives	
HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741159-B21
HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741155-B21
HP 200GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741151-B21
12G SAS Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives	
HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741146-B21
HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741142-B21
HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741138-B21
12G SAS Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
HP 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762263-B21
HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762261-B21
12G SAS Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives	
HP 800GB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	762270-B21
HP 1.6TB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	762272-B21
6G SATA Hot Plug LFF (3.5-inch) Enterprise Light G1 Solid State Drives	
HP 960GB 6G SATA Light Endurance LFF 3.5-in SC Converter ENT Light 3yr Wty G1 Solid State Drive	756604-B21
6G SATA Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
HP 1.6TB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	757339-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756657-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756636-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756621-B21
6G SATA Hot Plug SFF (2.5-inch) Enterprise Light G1 Solid State Drives	
HP 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive	756601-B21
6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value G1 Solid State Drives	
HP 1.6TB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive	757342-B21
HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756660-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756639-B21
HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756624-B21

Core Options

Hard Drive Blank Kits		
HP Large Form Factor Hard Drive Blank Kit		666986-B21
HP Small Form Factor Hard Drive Blank Kit		666987-B21

HP Networking

1 Gigabit Ethernet adapters

HP Ethernet 1Gb 4-port 331T Adapter		647594-B21
HP Ethernet 1Gb 2-port 361T Adapter		652497-B21
HP Ethernet 1Gb 2-port 332T Adapter		615732-B21

10 Gigabit Ethernet adapters

HP Ethernet 10Gb 2-port 560SFP+ Adapter		665249-B21
HP Ethernet 10Gb 2-port 561T Adapter		716591-B21

HP Power Supplies

HP Entry-Level Power Supplies

HP Server Redundant Power Supply Backplane Kit		745813-B21
HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module		744689-B21

NOTE: The above power supply option is 80Plus Gold-certified with an efficiency rating of up to 92%. Each power backplane kit (745813-B21) can support up to two (2) AC power input modules (744689-B21). Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.
NOTE: HP 800W/900W Gold AC Power Input Module only support up to maximum 800W redundant with 2 x 900W power module.
NOTE: Must select power backplane along with 900W power module:
900w power module x 1 requires 900W power backplane x 1 (Non-redundant PSU)
900w power module x 2 requires 900W power backplane x 1 (Redundant PSU)
NOTE: Recommend to select 900W for 2P configurations or check power advisor for power consumption for the customer usage case. Power specifications and technical content for all HP Server power supplies can be found at
http://www.hp.com/go/proliant/powersupply.

HP Computation and Graphics Accelerators

HP NVIDIA Quadro K2200 Graphics Accelerator		J0G89A

NOTE: Must select 2 processor if 2 graphic cards are selected.
NOTE: Must select 900W power supply when 2 graphic cards are selected.

NOTE: Only the above listed Graphics cards are HP standard supported options in this server.
NOTE: The NVIDIA Quadro modules are supported only on 64-bit versions of Linux and Windows operating systems as well as on Virtual Machine client operating systems. The supported bare metal operating systems are RHEL6, SLES 11 and Windows Server 2012 R2.
NOTE: Please see the HP Power Advisor for estimated power consumption of your individual system configuration prior to installing GPUs. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor.

HP Cooling Options

HP ML150 Gen9 PCI Baffle Kit		779861-B21

NOTE: Must be selected when a PCIe card is installed with any Networking, Controllers (SAS, SCSI and Fiber Channel), Graphic options.

Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Embedded Management		
	HP iLO Advanced	
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU	E6U59ABE
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU	E6U64ABE
	HP iLO Essentials	
	HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates Single Svr License	BD774A
	HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates Single Svr License	BD775A
	HP Integrated Lights-Out Essentials including 3yr 24x7 Technical Support and Updates E-LTU	E6U61ABE
	HP Integrated Lights-Out Essentials including 1yr 24x7 Technical Support and Updates E-LTU	E6U62ABE

High Performance Clusters		
	HP Insight Cluster Management Utility	
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License	BD476A
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B

NOTE: These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement.

	HP Insight Cluster Management Utility Media	BD477A

HP Storage Controllers		
	SAS Controller	
	HP Smart Array P440/4GB FBWC 12Gb 1-port Int SAS Controller	726821-B21
	HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller	726825-B21
	HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller	726897-B21

NOTE: B140i can't mix with any standup internal controller.
NOTE: HP ML150 Gen9Mini SAS P440/P840 Cable Kit must be selected PN: 784606-B21 for P440 controller (1 cable kit is required for P440x1).
NOTE: HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order controller card.

NOTE: B140i can't mix with any standup internal controller.
NOTE: Must select P840/4G Controller when apply 16SFF.
NOTE: HP ML150 Gen9Mini SAS P440/P840 Cable Kit must be selected PN: 784606-B21 for P840 controller (2 cable kits are required for P840x1).
NOTE: HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order controller card.

	SAS Controller Options	
	HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Servers	727258-B21
	HP Host Bus Adapter	
	HP H240 12Gb 2-ports Int Smart Host Bus Adapter	726907-B21
	HP H241 12Gb 2-ports Ext Smart Host Bus Adapter	726911-B21

NOTE: Must select for H240 controller.
1 cable kit is required for Hot Plug 4LFF.
2 cable kits are required for below:
- Hot Plug 4+4 LFF (with additional drive cage)
- 8SFF
NOTE: If H240 is the primary controller and if HP Mfg FIO Enable HBA Mode Setting is selected, then RAID is not allowed.
NOTE: B140i can't mix with any standup internal controller.
NOTE: HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order controller card.

	HP Cable Options	
	HP ML150 Gen9 Mini SAS H240 Cable Kit	784606-B21

Additional Options

HP ML150 Gen9 Mini SAS P440/P840 Cable Kit	784608-B21
Battery Holder	
HP ML150 Gen9 Smart Storage Battery Holder Kit	786710-B21

HP Tape Backup	**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP tape backup products see: http://www.hp.com/storage/SPOCK and http://www.hp.com/go/ebs. **NOTE:** Must select SAS controller to support internal SAS tape drives. **NOTE:** Tape drive and HDD total amount can't exceed SAS controller support qty.

Tape Drives

HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader	C0H19A
HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit	C0L99A
HP StoreEver LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit	EH946C
HP StoreEver LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rack-mount	EJ014B
HP StoreEver LTO-5 Ultrium 3280 SAS Tape Drive in 3U Rack-mount	EJ013B
HP StoreEver 1U SAS Rack-mount Kit	AE459B
HP StoreEver LTO-6 Ultrium 6650 SAS Internal Tape Drive	EH963A
HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive	EH964A
HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive	EH969A
HP StoreEver LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957B
HP StoreEver LTO-5 Ultrium 3000 SAS External Tape Drive	EH958B
HP StoreEver LTO-5 Ultrium 3280 SAS Internal Tape Drive	EH899B
HP StoreEver LTO-5 Ultrium 3280 SAS External Tape Drive	EH900B
HP StoreEver LTO-6 Ultrium 6250 External Tape Drive	EH970A
HP StoreEver LTO-4 Ultrium 1760 SAS Internal WW Tape Drive	EH919B
HP StoreEver LTO-4 Ultrium 1760 SCSI External Tape Drive	EH922B
HP StoreEver LTO-3 Ultrium 920 SCSI External Tape Drive	EH842B
HP Mini-SAS Cable for LTO Internal Tape Drive	AP746A
HP Mini-SAS Cable for DAT Internal Tape Drive	AP747A

HP Tape Storage Systems HP StoreEver MSL6480

HP StoreEver MSL6480 Scalable Expansion Module	QU626A
HP StoreEver MSL6480 Scalable Base Module	QU625A
HP MSL2024 0-Drive Tape Library	AK379A
HP MSL4048 0-Drive Tape Library	AK381A

HP Power Distribution Units (PDUs)	**HP Basic Power Distribution Unit (bPDU)**

HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU	H5M54A
HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Basic PDU	H5M56A
HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU	H5M55A
HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU	H5M57A
HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU	H5M58A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU	H5M61A
HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU	H5M59A
HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU	H5M60A
HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU	H5M75A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU	H5M63A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU	H5M64A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU	H5M62A
HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU	H5M67A

Additional Options

HP 13.2kVA 480 Volt IEC309 30A 3-Phase Input (15 Outlet) NA Basic PDU	H3X07A
HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU	H3X08A
HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer	H3X09A
HP 2.8kVA 24A Low Voltage NA/JP Modular Power Distribution Unit	252663-D71
HP 4.9kVA 24A High Voltage NA/JP Core Modular Power Distribution Unit	252663-D74
HP 8.3kVA 40A High Voltage NA/JP Core Modular Power Distribution Unit	252663-D75
HP 8.6kVA 24A Three Phase NA/JP Modular Power Distribution Unit	AF512A
HP 14.4kVA 40A Three Phase NA/JP Modular Power Distribution Unit	AF519A
HP 17.3kVA 48A Three Phase NA/JP Modular Power Distribution Unit	AF511A

NOTE: To learn more about HP Basic Power Distribution Units (bPDU), please visit the HP website at http://www.hp.com/go/pdu.

HP Monitored Power Distribution Units (mPDU)

HP 2.8kVA 120 Volt L5-30 Input (12xNEMA 5-20R)NA/JP Monitored PDU	D9N43A
HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Monitored PDU	D9N46A
HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU	D9N44A
HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU	D9N45A
HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU	G9Z05A
HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU	D9N47A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU	D9N51A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU	D9N52A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU	D9N53A
HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU	D9N49A
HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU	D9N58A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU	D9N61A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU	D9N62A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU	D9N54A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU	D9N59A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Watertight Input (12xC13/12xC19) NA/JP Monitored PDU	G9Z07A
HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU	D9N63A
HP Environmental Sensor for Remote Monitored PDUs	E2D53A

NOTE: Please see the HP Monitored Power Distribution Units QuickSpecs for information on additional options and product specifications.

HP Intelligent Power Distribution Units (iPDU)

HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF521A
HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF523A
HP 11.4kVA 16A 415V Three Phase L22-20 NA Core Intelligent Power Distribution Unit	AF900A
HP 17.3kVA 24A 415V Three Phase IEC309 NA Core Intelligent Power Distribution Unit	AF901A
HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF535A
HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF537A
HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit	AF531A
HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit	AF532A
HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit	AF533A
HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A

NOTE: Please see the HP Intelligent Power Distribution Units QuickSpecs for information on additional options and product specifications.

Additional Options

HP Managed Power Distribution Units (maPDU)

HP 2.8kVA 120 Volt L5-30 Input (24x NEMA 5-20) NA/JP Managed PDU	H8B48A
HP 3.6kVA 200-240 Volt Detachable C20 Input (7xC13/1xC19) WW Managed PDU	H8B49A
HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Managed PDU	H8B50A
HP 8.6kVA 208 Volt L15-30 3 Phase Input (18xC13/6xC19) NA/JP Managed PDU	H8B52A
HP 8.6kVA 208 Volt L21-30 3 Phase Input (20xC13/3xC19/1x NEMA 5-20) NA/JP Managed PDU	H8B53A
HP 14.4kVA 208V CS8365C 3 Phase Input (12xC13/12xC19) NA/JP Managed PDU	H8B55A
HP 17.3kVA 208V IEC309 60A 3 Phase Input (12xC13/12xC19) NA/JP Managed PDU	H8B56A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://www8.hp.com/h20195/v2/GetHtml.aspx?docname=c04376687
NOTE: To learn more, please visit the HP Uninterruptible Power Systems (UPS) web page.

HP Rack Mount Consoles, KVM Switches, and Keyboards	**HP Rack Mount Consoles**	
	HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
	HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor	AZ885A

NOTE: Please see the HP Rack Console QuickSpecs for information on additional options and product specifications.

HP KVM Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A
HP TAA 0x2x16xKVM Server Console G2 Switch	AF626A
HP KVM Console USB Interface Adapter	AF628A
HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
HP KVM Console USB 2.0 Virtual Media CAC Interface Adapter	AF629A
HP 1x4 USB/PS2 KVM Console Switch	AF611A
HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A

NOTE: To learn more, please visit the HP KVM Switches web page.

HP USB Keyboard and Mouse

HP USB BFR with PVC Free US Keyboard/Mouse Kit	631341-B21

NOTE: Please see the HP USB Keyboard and Mouse QuickSpecs for information on additional options and product specifications.

HP Uninterruptible Power Systems (UPS)	**HP Rack-mountable UPS**	
	HP R1500 G3 Uninterruptible Power Supply (UPS)	
	HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
	HP R/T3000 Uninterruptible Power System (UPS)	
	HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
	HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A
	R5000 Uninterruptible Power System (UPS)	
	HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A
	R7000 Uninterruptible Power System (UPS)	
	HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
	HP T750 G2 UPS Models	
	HP T750 G2 750VA NA Tower Uninterruptible Power System	AF446A
	HP T1500 G3 UPS Models	
	HP T1500 G3 1400VA NA Tower Uninterruptible Power System	AF450A

Additional Options

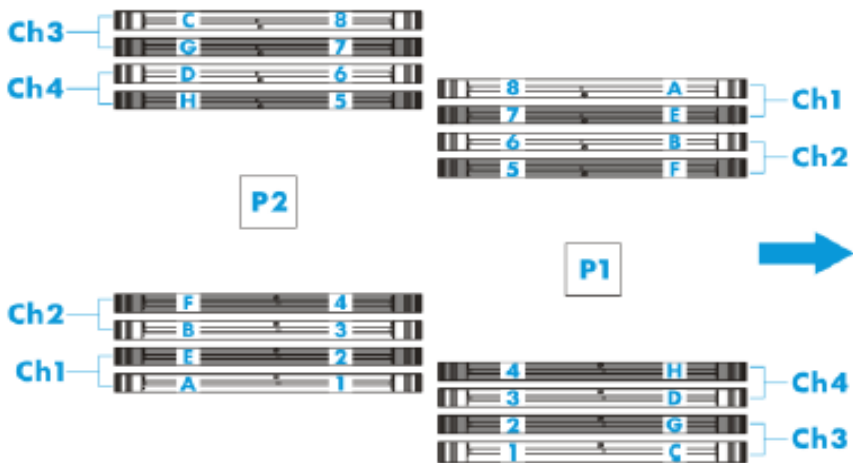**NOTE:** To learn more, please visit the HP Uninterruptible Power Systems (UPS) web page.

HP USB and SD Options	**HP Enterprise Mainstream Flash Media Kits for Memory Cards**	
	HP 8GB microSD Enterprise Mainstream Flash Media Kit	726116-B21

HP Care Pack Services	**Installation & Start-up Services**	
	HP Install ProLiant ML350e Service	U6D41E
	HP Startup ProLiant ML350e Service	U6D43E
	Foundation Care	
	HP 3y 24x7 ML150 Gen9 FC Service	U7WR1E
	HP 3y 24x7 w/DMR ML150 Gen9 FC Service	U7WR2E
	HP 3y 24x7 w/CDMR ML150 Gen9 FC Service	U7WR3E
	Proactive Care	
	HP 3y 24x7 ML150 Gen9 PC Service	U7WT8E
	HP 3y 24x7 w/DMR ML150 Gen9 PC SVC	U7WT9E
	HP 3y 24x7 w/CDMR ML150 Gen9 PC SVC	U7WU0E

Memory

Memory Subsystem Architecture Each Intel® Xeon® E5-2600v3 family processor socket contains four memory channels per installed processor with two DIMMs per channel for a total of eight (8) DIMMs or a grand total of sixteen (16) DIMMs for the server.

Memory Population guidelines

General Memory Population Rules and Guidelines:

. Install DIMMs only if the corresponding processor is installed.

. If only one processor is installed in a two processor system, only half of the DIMM slots are available.

. To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.

. When two processors are installed, balance the DIMMs across the two processors.

. White DIMM slots denote the first slot to be populated in a channel.

. Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.

. Do not mix RDIMMs or LRDIMMs.

. Quad rank RDIMMs are not supported in HP ProLiant ML350 Gen9 servers.

. Quad rank LRDIMMs are capable of up to three DIMMs per channel.

. RDIMMs operating at 1.2V.

. DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.

. The maximum memory speed is a function of the memory type, memory configuration, and processor model.

. The maximum memory capacity is a function of the memory type and number of installed processors.

. To realize the performance memory capabilities listed in this document, HP SmartMemory is required.

. There are four (4) channels per processor; eight (8) channels per server.
There are three (3) DIMM slots for each memory channel; twenty-four (24) total slots.
Memory channels1 and 3 consists of the three (3) DIMMs that are furthest from the processor.
Memory channel 2 and 4 consists of the three (3) DIMMs that are closest to the processor.

Memory

Intel Gen9 Supported Memory Bandwidth for HP ProLiant Gen9 Intel® Xeon®E5-2600v3 Series Processor Family

Memory Bandwidth and Capacity

[DIMM Type]	Registered Dimms (RDIMMs)			Load Reduced (LRDIMMs)
DIMM Rank	Single Rank		Dual Rank	Dual Rack
DIMM Capacity	4GB	8GB		16GB
Voltage	Std Voltage 1.2V			
SLOTS THAT CAN BE POPULATED				
16 slot servers	16			
MAXIMUM CAPACITY (GB)				
	64	128		256
1 DIMM Per Channel	2133			
2 DIMM Per Channel	2133			

DIMM slot and configuration diagram

DIMM slot and configuration diagrams

• Population order; start with "A" first, "B" second, "C" third, etc.

• When one processor is installed, install DIMMs in sequential alphabetic order: A, B, C, D, E, F ...

• When two processors are installed, install DIMMs in sequential

• alphabetic order: CPU1-A, CPU2-A,CPU1-B,CPU2-B,CPU1-C, CP2-C

	CPU 1		CPU 2		
	Slot #	population order	Slot #	population order	
Chnl 3	1	C	1	A	Chnl 1
	2	G	2	E	

	CPU 1		CPU 2		
	Slot #	population order	Slot #	population order	
Chnl 4	3	D	3	B	Chnl 2
	4	H	4	F	

	CPU 1		CPU 2		
	Slot #	population order	Slot #	population order	
Chnl 2	5	F	5	H	Chnl 4
	6	B	6	D	

	CPU 1		CPU 2		
	Slot #	population order	Slot #	population order	
Chnl 1	7	E	7	G	Chnl 3
	8	A	8	C	

Memory Speed by Processor Model

Processor Models	Supported Memory Speeds
E5-2603v3, E5-2609v3,	1600MHz
E5-2620v3, E5-2630v3, E5-2640v3,	1866MHz
E5-2650Lv3,	2133MHz

Memory

|	Pre-Configured Models	Standard Memory	Maximum Memory Plus Optional Memory	Standard Memory Replaced with Optional Memory
Standard and Maximum Memory Capacity (Pre-configured Models)	E5-2603v3,	4GB (1x4GB)	244GB (15x16GB, 1x4GB)	256GB (16x16GB)
	E5-2609v3,	8GB (1x8GB)	248GB (15x16GB, 1x8GB)	256GB (16x16GB)
	E5-2620v3,	16GB (1x16GB)	256GB (15x16GB, 1x16GB)	256GB (16x16GB)

DDR4 memory options part number decoder

NOTE: Capacity references are rounded to the common gigabyte (GB) values.
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
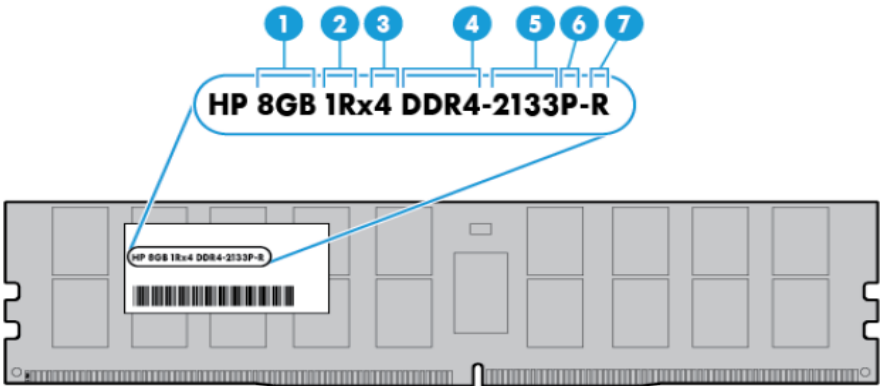
1. Capacity: 4GB/8GB/16GB/32GB
2. Rank: 1R = Single-rank; 2R = Dual-rank; 4R = Quad-rank
3. Data width: x4 = 4-bit; x8 = 8-bit
4. Memory generation: DDR4
5. Maximum memory speed: 2133 MT/s
6. CAS latency: P = 15
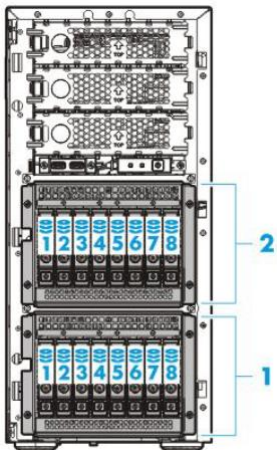7. DIMM type: R = RDIMM (registered); L = LRDIMM (load reduced)

Storage

4-bay LFF non-hot-plug drive model
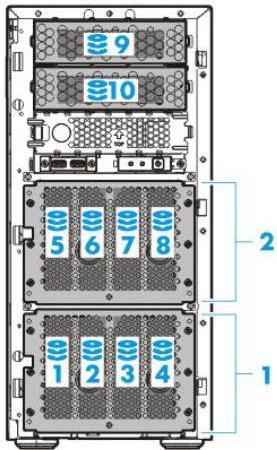
1-8	8 x LFF SATA/SSD Non-hot-plug Hard Drive Bays
9-10	Media Bays

NOTE: When populating 10 LFF, not able to install Tape Drive or Optical Drive. Possible Configurations: 1) 8LFF +1 ODD+ 1 Tape Drive (Full/Half), or 2) 9LFF + 1ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

8-bay SFF hot-plug drive model

1 x 1-8	8 x LFF SAS/SSD Hot Pluggable Hard Drive Bays
2 x 1-8	8 x LFF SAS/SSD Hot Pluggable Hard Drive Bays

4-bay LFF hot-plug drive model
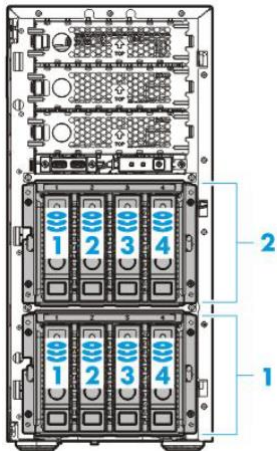
1 x 1-4	4 x LFF SATA/SSD Hot Pluggable Hard Drive Bays
2 x 1-4	4 x LFF SATA/SSD Hot Pluggable Hard Drive Bays

Technical Specifications

System Unit		
Tower Dimensions	17.03(H) x 7.87(W) x 24.41(D) in (43.26 x 20 x 62 cm)	
Tower Weight	Minimum:	37.26lb (16.9kg)
	Maximum:	61.73lb (28kg)
Input Requirements (for Standard 460W PSU, see power specifications tables for detail on 460W, 750W and 1200W power supplies)	Range Line Voltage	100 to 240 VAC
	Rated Input Current	For 550W Power Supply:6.7 A (at 100 VAC)3.3 A (at 100 VAC)
	Rated Input Frequency	47 to 63 Hz
	Rated Input Power	For 550 W Power Supply:< 670 W (at 100 VAC),< 660 W (at 200 VAC),
BTU Rating	Maximum	For 550 W Power Supply: 2201 BTU/hr (at 100 VAC),2153 BTU/hr (at 200 VAC)
Power Specifications	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: ML150 Gen9-Follow the instructions of the next screens.	
Power Supply Output	Rated Steady-State Power	For 550 W Power Supply:550 W (at 100 VAC),550 W (at 200 VAC),
	Maximum Peak Power	For 550 W Power Supply:550 W (at 100 VAC),550 W (at 200 VAC),
System Inlet Temperature	Standard Operating Support	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°Cper every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F).
	Extended Ambient Operating Support	For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae
		For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae
		System performance may be reduced if operating in the extended ambient operating range or with a fan fault. **NOTE:** Supports A3 extended ambient, A4 extended ambience will be available in early 2015.
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr(36°F/hr).
Relative Humidity	Operating	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of24°C (75.2°F) dew point or 90% relative humidity.
	Non-operating	5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
Altitude	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457m/min (1500 ft/min).

Technical Specifications

Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	

Idle

L WAd	3.8 Bels (1P LFF Non Hot-Plug Entry)
	3.8 Bels (1P LFF Hot-plug Base)
	4.3 Bels (1P SFF Hot-plug Performance)
L pAm	22 dBA (1P LFF Non Hot-Plug Entry)
	22 dBA (1P LFF Hot-plug Base)
	25 dBA (1P SFF Hot-plug Performance)

Operating

L WAd	3.8 Bels (1P LFF Non Hot-Plug Entry)
	3.8 Bels (1P LFF Hot-plug Base)
	4.1 Bels (1P SFF Hot-plug Performance)
L pAm	23 dBA (1P LFF Non Hot-Plug Entry)
	22 dBA (1P LFF Hot-plug Base)
	25 dBA (1P SFF Hot-plug Performance)

NOTE: Configurations tested for 1P LFF Entry models included two (2) 500GB LFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.
NOTE: Configurations tested for 1P and 2P SFF models included two (2) 500GB SFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.
NOTE: The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.

Emissions Classification	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

HP Dynamic Smart Array B140i Controller	**Number of PCI links**	Four
	PCI link rate	4 Gb/s
	Storage protocol support	SATA
	SAS/SATA peak data tranfer rate	6 Gb/s
	Number of SAS/SATA links	10 links
	SAS/SATA connectivity	2x4 connectors; 2x1 connectors
	Expander support	No
	Drives supported (max)	Up to 10 Internal Drives
	RAID support	0, 1, 10, 5 SATA
	Software management	HP SSA, SMH, SIM
	Warranty	Server warranty
	HP Secure Encryption license	Not Supported
	HP SmartCache License	Not Supported
	HP Smart Storage Administrator	Supported

Technical Specifications

HP Ethernet 1Gb 4-port 331i Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX	
	Data Transfer Method	PCI Express, two lanes (x2)	
	Controller	BCM5717	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 40 Mb/s combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 80 Mb/s combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 400 Mb/s combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 800 Mb/s combined
		100Base-TX (Half-Duplex)	1000Mb/s per port, 4000 Mb/s combined
		100Base-TX (Full-Duplex)	2000Mb/s per port, 8000 Mb/s combined
	Connector	RJ-45	
	Cable Support	10 Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000 Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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